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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,509	10/31/2003	Dhruva Ranjan Chakrabarti	200314557-1	9606

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EXAMINER

DAO, THUY CHAN

ART UNIT	PAPER NUMBER
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2192

NOTIFICATION DATE	DELIVERY MODE
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08/14/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/698,509	Applicant(s) CHAKRABARTI ET AL.	
	Examiner Thuy Dao	Art Unit 2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is responsive to the amendment filed on May 14, 2008.
2. Claims 1-13 have been examined.

Response to Amendments

3. In the instant amendments, claim 13 has been amended.

Drawings

4. The drawings are objected to because of minor informalities. FIG. 2A and 2B, "(Background Art)" should be replaced by - -Prior Art- - because only that which is old is illustrated. See MPEP § 608.02(g).

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Arguments

5. Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

6. In the previous Office action mailed February 25, 2008, claim 13 was rejected under 35 USC 101 because the claimed invention directed to non-statutory subject matter.

In the instant amendments, the Applicants amended claim 13 to recite "[a] computer-readable medium" instead of "[a] computer program product". However, to fully direct to statutory subject matter, the phrase in claim 13 is considered to read as - -

A computer-readable storage medium [[encoded with]] storing a computer program in executable form ...- - as similarly recited in independent claim 7.

Appropriate correction is requested.

Claim Rejections – 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 7,080,366 to Kramskoy et al. (art made of record, hereafter "Kramskoy") in view of US Patent No. 6,651,243 to Berry et al. (art made of record, hereafter "Berry").

Claim :

Kramskoy discloses *a method of compiling a computer program with inline specialization, the method comprising:*

given a call stack/call frames (e.g., FIG. A5, col.63: 8 – col.64: 42; col.39: 14-23),

if multiple call-chains in the call stack/call frames have a common call site (e.g., FIG. 1E, col.20: 10-49, common call sites as 1072, 1080, 1084),

inlining the common call site in one or more of the call-chains (e.g., FIG. 1E, inlining the common call sites 1072, 1080, 1084 in a dominant path 1088, col.20: 27 – col.21: 20; col.39: 14-23),

without inlining the common call site into all of said multiple call-chains having the common call site (e.g., FIG. 1E, without inlining 1078, 1082, 1086 into said dominant path, col.20: 31-62).

Kramskoy does not explicitly disclose a *call-graph*.

However, in an analogous art, Berry further discloses *a call-graph* (e.g., FIG. 11A-B and related text).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Berry's teaching into Kramskoy's teaching. One would have been motivated to do so as one of many ways to reflects the call stacks as suggested by Berry (e.g., col.18: 19-49, FIG. 11-12, call stacks presented as either tree or table).

Claim 2:

The rejection of claim 1 is incorporated. Kramskoy discloses *whenever a call site from routine x to routine y is inlined, new call sites are added from routine x to all routines inlinable within routine y* (e.g., col.79: 6-36; col.85: 48-67).

Claim 3:

The rejection of claim 2 is incorporated. Berry further discloses *materialization of summary information for the new call sites added to the call-graph* (e.g., col.18: 19-49, FIG. 11-12 and related text).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Berry's teaching into Kramskoy's teaching. One would have been motivated to do so as one of many ways to reflects the call stacks as suggested by Berry (e.g., col.18: 19-49, FIG. 11-12, call stacks presented as either tree or table).

Claim 4:

The rejection of claim 3 is incorporated. Kramskoy discloses *addition of the new call sites to a global work-list so that the new call sites are considered for inlining* (e.g., col.85: 48-67; col.86: 36-61).

Claim 5:

The rejection of claim 4 is incorporated. Kramskoy discloses *addition of dependence relationships between call sites, wherein if a new call site, y, is added because of inlining of call site, x, then y is dependent on x* (e.g., col.86: 36-61; col.84: 13-64).

Claim 6:

The rejection of claim 5 is incorporated. Kramskoy discloses *patching of the new call site, y, during inline transformation of call site, x, and generating an intermediate transformation for the new call site, y* (e.g., col.79: 6-36; col.86: 6-35).

Claim 7:

Kramskoy discloses *an apparatus for compiling a computer program with inline specialization* (e.g., FIG. A5, col.63: 8 – col.64: 42; col.39: 14-23), *the apparatus comprising:*

memory configured to store computer-readable instructions and data; a processor configured to access said memory and to execute said computer-readable instructions (e.g., FIG. 1E, col.20: 10-49, common call sites as 1072, 1080, 1084),;

computer-readable instructions stored in said memory and configured to inline a common call site in one or more call-chains in a call stack/call frames (e.g., FIG. 1E, inlining the common call sites 1072, 1080, 1084 in a dominant path 1088, col.20: 27 – col.21: 20; col.39: 14-23),

without inlining the common call site into all call-chains having the common call site (e.g., FIG. 1E, without inlining 1078, 1082, 1086 into said dominant path, col.20: 31-62).

Kramskoy does not explicitly disclose a *call-graph*.

However, in an analogous art, Berry further discloses *a call-graph* (e.g., FIG. 11A-B and related text).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Berry's teaching into Kramskoy's teaching. One would have been motivated to do so as one of many ways to reflects the call stacks as

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suggested by Berry (e.g., col.18: 19-49, FIG. 11-12, call stacks presented as either tree or table).

Claim 8:

The rejection of claim 7 is incorporated. Kramskoy discloses *whenever a call site from routine x to routine y is inlined, new call sites are added from routine x to all routines inlinable within routine y* (e.g., col.84: 13-64; col.86: 6-35).

Claim 9:

The rejection of claim 8 is incorporated. Berry further discloses *materialization of summary information for the new call sites added to the call- graph is performed* (e.g., col.18: 19-49, FIG. 11-12 and related text).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Berry's teaching into Kramskoy's teaching. One would have been motivated to do so as one of many ways to reflects the call stacks as suggested by Berry (e.g., col.18: 19-49, FIG. 11-12, call stacks presented as either tree or table).

Claim 10:

The rejection of claim 9 is incorporated. Kramskoy discloses *the new call sites are added to a global work-list so that the new call sites are considered for inlining* (e.g., col.85: 48-67; col.86: 6: 35).

Claim 11:

The rejection of claim 10 is incorporated. Kramskoy discloses *dependence relationships are created between call sites* (e.g., col.86: 6-35; col.79: 6-36).

Claim 12:

The rejection of claim 11 is incorporated. Kramskoy discloses *the inline transformation patches up an intermediate representation of the new call sites* (by

considering the dependence relationships) before potentially inlining the new call sites (e.g., col.86: 36-61; col.84: 13-64).

Claim 13:

Kramskoy discloses a computer-readable storage medium storing a computer program in executable form,

the computer program being a source code compiler with cross-module optimization (e.g., FIG. A5, col.63: 8 – col.64: 42; col.39: 14-23),

the compiler including an inline specialization feature such that given a call stack/call frames (e.g., FIG. 1E, col.20: 10-49, common call sites as 1072, 1080, 1084),

if multiple call-chains in the call stack/call frames have a common call site (e.g., FIG. 1E, inlining the common call sites 1072, 1080, 1084 in a dominant path 1088, col.20: 27 – col.21: 20; col.39: 14-23),

the common call site is inlined in one or more of the call-chains, without having to inline the common call site into all of the multiple call-chains having the common call site (e.g., FIG. 1E, without inlining 1078, 1082, 1086 into said dominant path, col.20: 31-62).

Kramskoy does not explicitly disclose a *call-graph*.

However, in an analogous art, Berry further discloses a *call-graph* (e.g., FIG. 11A-B and related text).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Berry's teaching into Kramskoy's teaching. One would have been motivated to do so as one of many ways to reflects the call stacks as suggested by Berry (e.g., col.18: 19-49, FIG. 11-12, call stacks presented as either tree or table).

Conclusion

9. Any inquiry concerning this communication should be directed to examiner Thuy Dao (Twee), whose telephone/fax numbers are (571) 272 8570 and (571) 273 8570,

respectively. The examiner can normally be reached on every Tuesday, Thursday, and Friday from 6:00AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam, can be reached at (571) 272 3695.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is (571) 272 2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Thuy Dao/
Examiner, Art Unit 2192

/Tuan Q. Dam/
Supervisory Patent Examiner, Art Unit 2192